REMARKS

In response to the Official Action of April 19, 2005, claims 1 and 7 have been amended. Claim 7 has been amended to overcome the objection raised at paragraph 1 of the Official Action. Therefore, the informality concerning the phrase "the short-circuit element" has been overcome.

Referring now to paragraphs 2 and 3 of the Official Action, applicant's attorney respectfully requests reconsideration of the rejection of claims 1, 2, 6, 7, 9, 23, 24, 30 and 31 under 35 U.S.C. §102(b) as anticipated in view of US patent 6,476,769, Lehtola. Slight amendment has been made to claim 1 to emphasize that by nature of the arrangement being of the diversity antenna type, that each of the recited antenna elements has substantially the same resonant frequency. In support for this amendment, reference is made to the *Introduction to 3G Mobile Communications, Juha Korhonen, Artech House Publisher, ©2001, at page 89* (enclosed as Attachment A). This reference states that antenna diversity "means that the same signal is either transmitted or received (or both) via more than one antenna element in the same base station." Thus, the resonant frequency of each antenna element of a diversity antenna is substantially the same.

The Examiner states at paragraph 3 that Figure 1 of Lehtola shows an antenna device for use in a mobile phone which comprises a ground element (5), a pair of antenna elements (30, 40) wherein each antenna element includes a first elongated conductive element and a second elongated conductive portion transversal and in contact with the first elongated conductive element and a feed arrangement (24, 50) as well as a short-circuit element (22, 42) coupled between the first elongated conductive element and the ground element. Although Lehtola is directed to a radio antenna for use in wireless telecommunication frequencies, it is specifically directed not to a diversity antenna (as set forth in the claims of the present invention) but rather to a multi-band antenna. As set forth in column 1, lines 6-7 of Lehtola:

> "The present invention relates generally to a radio antenna and, more specifically, to an internal multi-band antenna for use in a hand-held telecommunication device, such as a mobile telephone." (emphasis added)

As set forth in the Background of the Invention section of Lehtola (column 2, lines 10-41), it is noted that the antenna is particularly for use as an internal multi-band antenna for various frequencies such as those associated with E-GMS900, GSM1800, PCS1900 and UMTS. To obtain such a multi-band antenna, Lehtola discloses a first switch which is connected between the first feed and ground and a second switch connected between the second feed and ground. Thus, what is shown in Figure 1 is not the multi-band antenna but only an isometric view of the radiating elements of a multi-band antenna. This is clearly seen with regard to the description of Figure 1 set forth at column 3, lines 50-52. The actual antenna structure arrangement is the combination of the radiating elements shown in Figure 1 in conjunction with the switching devices as illustrated in Figures 2, 3a and 3b.

As set forth in Lehtola at column 3, line 65 through column 4, line 3, the radiating elements shown in Figure 1 actually comprise three separate radiating elements; namely, first radiating element (20), second radiating element (30) and third radiating element (40). Each of these radiating elements are dimensioned for radiating at different frequencies. Thus, it is described at column 4, lines 7-10 that the first radiating element (20) preferably has a first resonance frequency substantially in the range of 1710 MHz to 1880 MHz. It further goes on to state that the second radiating element has a second resonance frequency substantially lower than the first resonance frequency and that the third radiating element (40) has a third resonance frequency generally higher than the first resonance frequency and that preferably the second resonance frequency is substantially in the range of 880 MHz to 960 MHz and the third resonance frequency is substantially in the range of 1850 MHz and 1990 MHz when switching device (60) is in the open position and switching device (62) is in the closed position (see column 4, lines 56-64). The radiating elements are switched by means of a radio-frequency module (70)

that feeds the feed line (50) connected to a radio frequency module (72) for feeding. Switching device (60) is connected between the feed line (24) and the ground plane and a switching device (62) is connected between the feed line (50) and the ground plane (see column 4, lines 43-48). Switching devices (60) and (62) are shown in Figures 2, 3a and 3b and it is disclosed in Lehtola that these switching devices operate either in an open position or a closed position. As shown in Figure 3a, when switching device (60) is open, switching device (62) is closed, and *vice versa* (see Figure 3b). In the configuration shown in Figure 3a, the above recited second and third resonance frequencies are obtained and when configured as shown in Figure 3b, the third radiating element (40) has a fourth resonance frequency generally higher than the third resonance frequency and the first radiating element (20) has a fifth resonance frequency substantially equal to the third resonance frequency (see column 4, line 64 through column 5, line 7).

It is therefore clear that the overall structure in Lehtola is directed to a multi-band antenna that can obtain various operating resonance frequencies by use of the switching devices (60) and (62) which change the electrical configuration of the first, second and third radiating elements shown in Figure 1.

What is absolutely clear in Lehtola is that it is not in any way directed to a diversity antenna arrangement for a mobile station as disclosed and claimed in the present application. From the above discussion of Lehtola, it is therefore clear that the use of the switching devices in accordance with Figures 3a and 3b shows that only one of the antennas can be fed or used to receive a radio signal at a given time. This type of antenna cannot be used for diversity which generally requires two antennas that can receive radio frequency energy at the same time. In fact, the most effective diversity combining algorithmic technique such as maximum ratio combining (MRC) require two simultaneous working antennas. It is only the so-called switch diversity combining that can utilize two antennas that do not operate at the same time, but even in this type of operation irrespective of the combining method, at least two antennas must operate at the same frequency band so as to have essentially the same resonance frequencies. Clearly, the elements

shown in Figure 1 of Lehtola are purposely designed to have different resonance frequencies as described above.

As a result, the antenna arrangement of Lehtola does not and cannot work as a diversity antenna arrangement and therefore the elements which the Examiner cites in the Official Action as anticipatory are in fact not elements which represent or can be argued to represent a diversity antenna arrangement. In order to emphasize the difference between the present invention over that of Lehtola, in addition to the preamble reciting that the present invention is directed to a diversity antenna arrangement, amendment has been made to claim 1 to require that each antenna element has substantially the same resonant frequency, which of course is required by a diversity antenna (see earlier discussion).

Since claim 1 as amended is believed to be neither anticipated nor suggested by Lehtola, it is respectfully submitted that claims 2-31 are further distinguished over Lehtola since they all ultimately depend from amended claim 1.

At paragraph 8 of the Official Action, it is noted that claims 32-35 are allowed. It is further noted that claim 32 is directed to a diversity antenna system for a mobile station but that it does not recite at least a pair of PIFA antenna elements. However, for reasons set forth above with regard to claim 1, claim 32 is believed to be distinguished over Lehtola.

Referring now to paragraph 9 of the Official Action, it is respectfully submitted that the patents to Hoashi et al (US 6,768,460), Yeh (US 6,801,168) and Sekine et al (US 6,683,575) do not alone or in combination with the previously cited art disclose or suggest a diversity antenna arrangement, diversity antenna system, or method of manufacturing a diversity antenna arrangement or a method of operating a mobile station for a mobile communication network comprising the features of the present application as disclosed and claimed herein.

In view of the foregoing, it is respectfully submitted that the present application as amended is in condition for allowance and such action is earnestly solicited.

Respectfully submitted,

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